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Best practices in greening transportation at Wageningen University & Research

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Abstract. Key words for the sustainable mobility policy of Wageningen University & Research (WUR) are: safe, healthy, sustainable, accessible, emission reduction and future-focused. WUR mobility policy has three key elements, in the following order of importance: 1) less travel, 2) transition to sustainable modes of transport, and 3) efficient, clean transport. The objective is to further decrease our annual carbon emissions by at least 2%. WUR's long-term mobility policy is outlined in the Mobility Plan 2030. Measures are focused on encouraging cycling and use of public transport, and discouraging use of fossil fuels for business travel and commuting. Alternatives to air travel and sustainable transport options are facilitated. Examples of promoting sustainable transport are offering e-bike test drives for employees and the introduction of an app for business trips with electric cars, bicycles and public transport. A stricter policy on business travel by train within Europe was implemented, with a Travel Check for staff to find alternatives for air travel. In addition, due to the corona pandemic, WUR drew up a policy on remote working and aims to maximise sustainability benefits of remote work.

Keyword:

Sustainable transport, sustainable mobility, low-emission vehicles, remote working

1. Introduction

According to its mission 'To explore the potential of nature to improve the quality of life' [1], Wageningen University & Research (WUR) has sustainable development as a fundamental philosophy. Besides operationalising sustainable development in education and research, WUR also regards sustainability as an important principle in its operational management. Promoting and achieving sustainability is considered as a continuous and on-

going process.

WUR incorporates sustainability in mobility strategies, policies and practices. In this paper we give an insight into the steps taken within WUR to make the shift from fossil based transport options towards mobility with low -or even zero- emissions.

We will first describe WUR's strategy and policy (section 2). Section 3 will give an insight in our best practices in greening transportation. In section 4 we will discuss how we monitor changes and progress. We will conclude with some remarks on the results so far and the challenges ahead (section 5).

2. WUR's mobility strategy and policy

2.2. Mobility in 2030

Mobility is an essential component of sustainable operational management at WUR. Between 2010 and 2020 there has been a clear increase in travel at WUR. The annual CO_2 assessments indicate that CO_2 emissions due to travel show an increasing trend since 2010, in particular due to an increase in the number of kilometres travelled by aeroplane and motor vehicles. [2]

To tackle the increased negative impact of all travel, WUR adopted in 2019 a renewed, long-term policy on sustainable mobility: the Mobility Plan 2030 [2], with an associated implementation agenda [3]. This policy focuses on sustainable transport options, such as cycling and public transport, discouraging travel by car or air and making transport more sustainable. Parts of the implementation agenda include encouraging the use of public transport for business travel within the Netherlands and to nearby destinations in Europe, facilitating and encouraging the use of video conferencing options, and promoting commuting by bicycle and using electric vehicles. WUR's ambition is to reduce Greenhouse gas (GHG) emissions of all WUR transport by at least 2% annually [2, 3]. As a result, CO_2 emissions linked to travel will decrease from roughly 20 kt in 2016-2018 to 14 kt CO_2 in 2030 (see Figure 1). Due to the Covid-19 pandemic, CO_2 emissions were low in 2020 (blue dot).

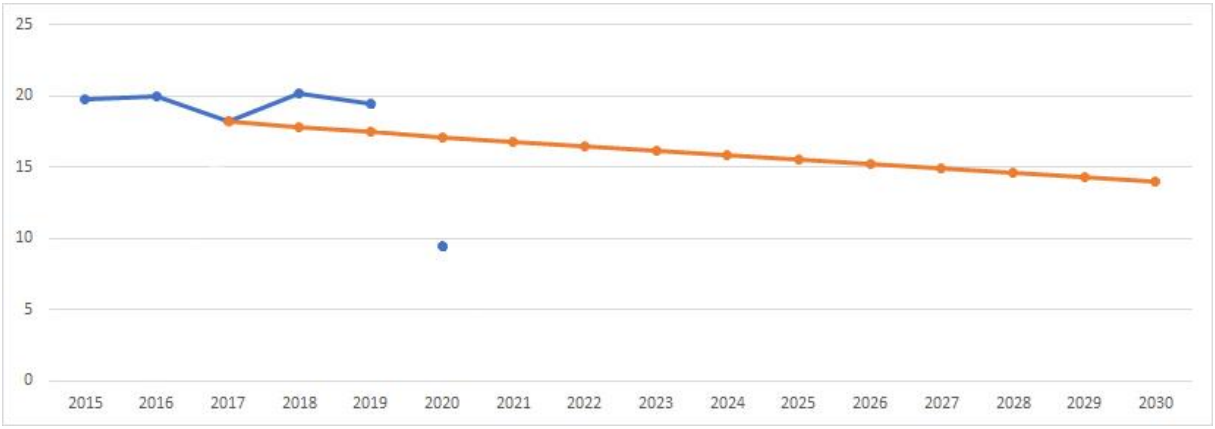

Figure 1. CO2 emissions due to transport in kt, actual (blue line/dot) and target (orange line)

Table 1. Matrix of measures for more sustainable transport [2]

1. Reduce	2. Switch	3. Green
Reducing transport movements: - Sharing cars - Carpooling - Flexible working (HNW - the new working method) - Teleworking - Video conferencing - Smart flying (combination) - Combining goods traffic Reducing distance: - Living closer to work Purchasing locally	Transport alternatives: - Mobility management - Mobility budget - Financial incentives: Public transport and bicycle - Substantially improving public transport options - Clean two-wheeled vehicles (e-bikes/scooters)	Cleaner transport: - Electric cars - Green gas - Hydrogen - Sustainable fuel blend - Fuel-efficient cars - Zero emissions Efficiency: - Improving traffic flow - Less traffic - The new driving method Optimal tire pressure

The WUR mobility policy has three key elements, in the following order of importance: 1) Reduce: less travel, 2) Switch: transition to sustainable modes of transport, and 3) Green: make remaining transport cleaner and more efficient. See Table 1 for an overview of possible measures per step. Main goal is to reduce the impact on the environment: saving energy, contributing to improved air quality (through the reduction of fine particles, hydrocarbons, and NO_x), decreasing noise pollution from traffic, and addressing the issue of climate change by reducing CO_2 emissions. Reduction of travel has a direct, positive effect on both sustainability and expenses, and may also improve accessibility if it leads to fewer traffic bottlenecks. Promoting active mobility (such as walking or cycling) contributes to the health and wellbeing of employees. [2, 4]

2.3. Implementation of sustainable transport policies

Prior to the Mobility Plan, WUR already took various steps towards more sustainable transport. Use of video conferencing and communications software was encouraged to limit business travel. Also, the use of trains and buses for business trips was encouraged. Measures are focused on facilitating more sustainable transport options: cycling, public transport, and electric vehicles. Examples include making the 'Business Card' of the national railway company available for business trips and establishing a bicycle scheme which allows employees to buy a bike for their commute with tax benefit. Other measures were: improving accessibility for sustainable transport, making transport safer and installing charging stations for electric bicycles, scooters and cars. WUR also actively participates in policy programmes from the municipalities and the Province of Gelderland to improve campus accessibility by public transport and to encourage bicycle use for greater distances (>7.5 km) by means of express bicycle routes[2, 5, 6].

The Mobility Plan 2030 [2] contains a broad vision on sustainable mobility and builds on previous actions. The actions for 2018-2022 are specified in a roadmap, the Mobility Implementation Agenda for 2018-2022 [3]. The agenda elaborates on the key principles for

long-term mobility policy as outlined in the Mobility Plan 2030. Measures focus on:

1. Encouraging cycling (including electric);
2. Encouraging the use of public transport;
3. Discouraging car use for commuting from home to work and for business travel;
4. Facilitating alternatives to air travel and other business travel methods;
5. Making transport options more sustainable.

In section 3 we will elaborate more on the measures and plans that were implemented from 2019 onwards.

3. Best practices in greening transportation

3.1. Encouraging use of low emission vehicles

Cycling

More than 50% of all WUR employees already commute by bike, but there is still room for improvement, in particular for employees living in a range of 7.5-15 km from work. WUR encourages cycling for commute and (business) trips. Examples of measures and projects are:

- A project to improve the quality of bicycle parking facilities on campus. Outdated bicycle racks have been replaced, and more space has been provided for special bicycles, such as cargo bikes and electric bicycles.
- The project E-bike2WUR gave employees the opportunity to try out an e-bike or speed pedelec (an e-bike that can drive up to 45 km an hour) for two weeks for their commute to work. This project is targeted at employees living within the 7.5-15 km range, and further for speed pedelecs. Approximately 150 employees joined. Some of them bought an e-bike or speed pedelec afterwards.
- WUR has a bicycle scheme that gives staff the opportunity to buy a (private) bicycle with tax benefit. The scheme was recently adapted: the term increased from three to five years. This increased the amount to be spent to max. 2.500 euro), making it easier for staff to buy a (electric) bicycle suitable for longer distances.
- WUR is involved in the development of a network of fast bicycle routes towards Wageningen Campus.
- WUR commits to the “Bicycle Mission for Higher Education” from the Ministry of Infrastructure and Water Management. The mission aims to increase the number of employees cycling to WUR by 10%. [5, 6]

Public transport

With the goal of reducing the university's CO_2 emissions from air travel for business trips, a new policy was introduced in 2019. This policy prescribes public transport for certain destinations in Europe. The policy works with a list of cities in Europe that are easily or reasonably accessible by public transport, based on the combination of travel distance and travel time. [8]

WUR lobbied transport companies and the provincial government to increase the bus frequency from Ede-Wageningen train station to Wageningen Campus. The service has been increased from seven to eight buses per hour. The accessibility of the campus by public transport will be improved in the near future due to the planned direct bus connection from ICE station Arnhem Central to Wageningen Campus. [5, 6]

Sail to the COP

In 2019, a group of young people, some of them Wageningen students, set sail for the climate summit in Chile as a protest against air traffic. WUR was one of the sponsors. Halfway through the journey the summit was moved to Madrid. This came as a blow to the campaigners but they did not let that throw them off course. They continued their journey and renamed their mission Rail to the COP calling on European COP participants to travel overland to the summit in Madrid. During their time at sea the group worked as a think tank on solutions for fair and sustainable travel. The results are presented in their report Change Course. [5, 7]

Figure 2. Encouraging use of low emission transport

Electric transport

The number of electric delivery vans used by service departments (IT and buildings services, campus services) of Facilities and Services increased from 2019 onwards. In contracts for leased and rental cars the focus shifted towards use of full electric vehicles. Charging points for electric cars are available on Wageningen Campus. Compared to previous years, 2019 saw a significant increase in the use of the charging facilities. There are also charging stations for e-bikes and scooters at bicycle-parking facilities in various buildings. [(5, 6]

3.2. Mobility as a Service

WUR aims to increase its options for sustainable and user-friendly travel. To this end, WUR has signed an agreement with a supplier of Mobility as a Service (MaaS). In March 2021, Mobility as a Service was first introduced on Campus. It offers shared mobility services (rental cars and vehicle fleet), based on sustainability criteria from the Mobility Plan. MaaS enables employees, students and at a later stage also other residents of the campus and the municipality of Wageningen, to make use of a regional, sustainable, integrated, convenient and innovative transport concept. The first phase of this journey is to offer electric shared cars for business trips for WUR employees. Charging stations for electric shared cars have been installed and the first electric shared cars are available. The cars are easy to book with an app. Later in the process, bicycles and public transport will be added and the target groups will also be expanded to include students and other users. [7, 9]

3.3. International business trips

All business trips, specifically business trips outside of Europe, are subject to the principles described in the Mobility Plan 2030 and the university's travel policy: "Travel only if it is truly necessary, and with as little environmental damage as possible." Staff members are expected to be selective in taking trips. In addition, the basic principle of the policy for international business travel is that public transport is preferable for nearby destinations in Europe. The WUR Travel Check is a tool for employees to identify the most sustainable transport option for their business trips and contains a map with the destinations that can be reached by train within 6–8 hours. [7, 8, 10] In 2020 WUR won the Sustainable Business Travel Award from The Dutch Association for Travel Management (NATM). WUR was nominated because of the changes we have made to increase sustainability in our travel policy, in particular encouraging business travel by train instead of by plane. [11]

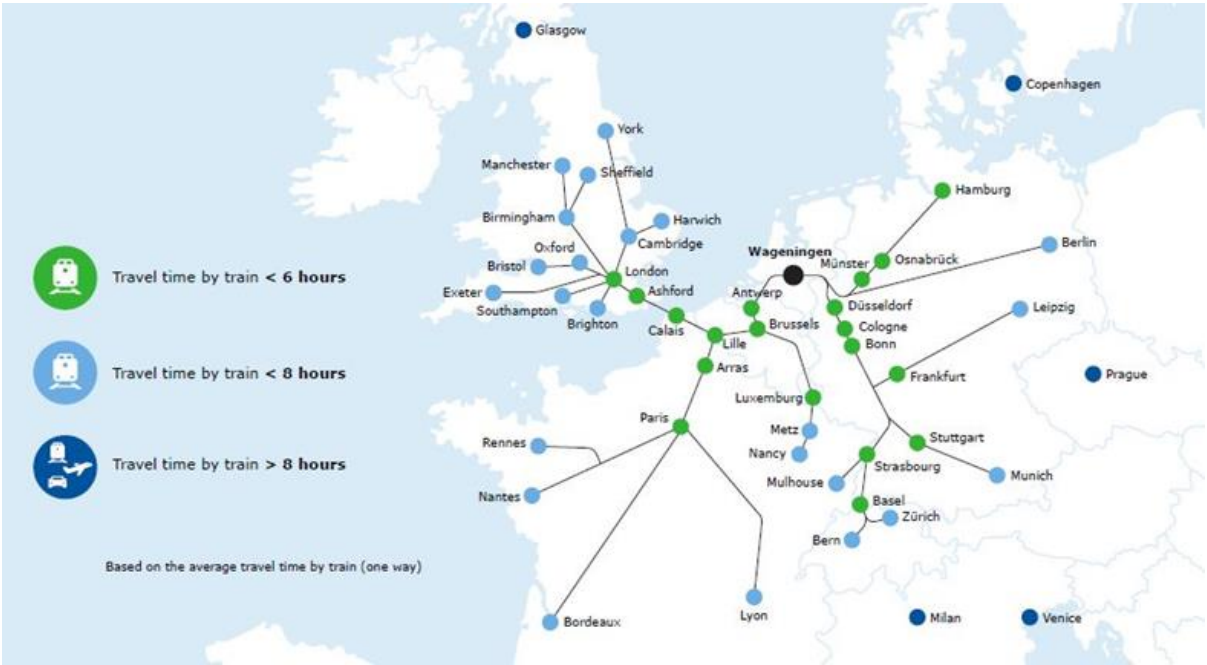

Figure 3. Travel time in Europe, mapped out in the WUR Travel Check [10]

4. Monitoring mobility

4.1. Mobility survey

The methods that employees use to travel to work are regularly assessed. The last survey (2019) showed that many (52%) WUR employees that work on Wageningen Campus travel by bicycle. This is very high when compared to the national average (25%). [12] Of all the employees in Wageningen, 38% travel by car, 5% by public transport. 59% of the students travel to campus by bicycle, 27% use public transportation, 8% by car. Compared to the previous survey in 2015 the numbers of students travelling by public transport and car increased. One of the conclusions of the 2015 survey was that 91% of the employees who live within 7.5 km of the workplace travel by bicycle. 30% of employees who use cars live between 7.5 and 30 km from the workplace. It is precisely in this demographic that there is still room for improvement, e.g. by encouraging the use of e-bikes even more. The percentage of employees using public transport to commute is low. However, the use of public transport for business trips in the Netherlands is rather high, roughly equal to travel by car, thanks to regulations for business trips and use of the so called Business Card of the national railway company. [13, 14]

4.2. Mobility in the carbon footprint

Each year WUR determines its CO_2 footprint. This provides insight into our impact on climate and how to improve our climate policy. Transport movements are becoming an increasing share of emissions in WUR's CO_2 footprint. This primarily involves the CO_2 emissions from air travel, work commute, and the use of cars and public transport for business trips. In the reference year 2010, 16.6 kt of CO_2 was related to mobility. This was 17% of the total 82.9 kt of emissions. In 2017, the mobility percentage was 45%: 18.2 kt of the total CO_2 footprint of 40.7 kt. In 2019 this share was 47%: 19.4 kt out of the total footprint of 41.4 kt CO_2. Air travel alone accounted for 23% of total CO_2 emissions. Due to Covid-19 employees travelled considerably less in 2020: the share in the carbon footprint dropped to 27% in 2020. [2, 6, 7]

5. Concluding remarks: the challenges ahead

Over the years, WUR has taken various steps to lower the environmental impact of travel. The Mobility Plan 2030 [2] was implemented to bring WUR's sustainable mobility policy to a higher level. It contains a broad vision on the topic and systematically addresses all aspects of mobility. Since 2019, various actions were carried out to encourage the use of public transport and (electric) bicycles, to discourage car use, to facilitate alternatives to air travel and to make the various transport options more sustainable. Due to the Covid-19 pandemic, which obviously had a large impact on travel patterns, we have not been able to monitor the impact of the various measures. Therefore, in the near future we intend to monitor the results and impact of the various measures and to adapt, refine and renew the set of measures for better results and more impact.

Our target for CO_2 emission in 2030 is 14 kt. Less travel in 2020-2021 resulted in a sharp decline in CO_2 emissions, from circa 20 kt in 2019 to 10 kt in 2020. Covid-19 accelerated many changes in working patterns. During the pandemic new working arrangements were

developed which are of interest also after the pandemic because they have certain advantages. Two examples are:

1) Virtual meetings and e-conferences; Advantages are a.o.: less travel time, lower travel expenses and environmental impact, more options to engage with colleagues and students in other locations; more inclusive meetings for those who are unable to travel.
2) Remote/hybrid working; Advantages are a.o.: less commuting time, lower travel expenses and environmental impact, more autonomy and flexibility, better work–life balance, reduced need for office space.

It is impossible to tell yet to what extent the recent changes brought about by Covid-19 will be permanent. The challenge is to learn from the experiences with new working arrangements and to put these lessons into practice. From an environmental point of view, a permanent reduction in travel is of course desirable and will be encouraged, by promoting virtual meetings, e-conferences and remote/hybrid working. At WUR, we expect new patterns of work to continue, at least to some extent. For example, employees are expected to work from home for 2 days a week on average, as opposed to 1 day a week before the pandemic. For our CO_2 emissions target, a reduction in air travel is where the biggest challenge lies. Without this reduction it will hardly be possible to reach the target, but international travel is, at least to some extent, inseparable from a University and Research organisation such as WUR.

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